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hundred species taken in order, in Saccarda's Sylloge Fungorum, shows fifty-five to be hypophyllous, thirty amphigenous, and fifteen epiphyllous, the proportion of amphigenous species having slightly increased. We also notice here a decided increase in epiphyllous species. This may likely be accounted for from its being an intermediate stage, springing from the germination of the æcidiaspores. These, produced, as we have seen, with but few exceptions, on the lower surface of the leaf, would tend to drop their spores on the upper surface of the leaves below them, thus perhaps giving rise to this more frequent epiphyllous character of the uredo.

In the teleutospore stage of species in Burrill's Uredineæ (Puccinia, Uromyces, etc.), the amphigenous species predominate by a small majority.

The increasing frequency of amphigenous position from the first stage to the last thus seems to be due to the older and more extensive growth of the fungus in the tissue of the host. Its continued growth likely injures and somewhat softens the upper more firm palisade tissue, thus allowing a breaking out above.—HERBERT A. WEBBER, *Lincoln, Neb.*

ZOOLOGY.

Gastrotricha.—Carl Zelinka, of Gratz, has recently monographed the Gastrotricha of the world (*Zeitschr. wiss. Zool.*, XLIX., Pt. 2, 1889). These are small aquatic forms the position of which is very uncertain. They are defined by Zelinka as follows: Without retractile ciliated wheels on the anterior end; with two ciliated bands extending the length of the ventral surface; with two coiled water-vascular canals each bearing a rod-like ciliated funnel and terminating separately on the ventral surface; a simple brain, not completely separate from the ectoderm; simple muscle cells; paired ovaries; fore-gut muscular, Nematode-like, without jaws, with straight glandless mid-gut and pear-shaped hind-gut, rectum and dorsal anus; with primary body cavity. With these points Zelinka is inclined to place them near the Rotifiers. He describes the anatomy, dealing especially with the skin and its appendages (scales, hairs, etc.), water-vascular system, nervous system, sense organs (tactile hairs, eye spots?), muscular system, alimentary tract, and genital organs. In all, thirty-two species are enumerated. The following key serves to separate the genera:

	With caudal fork;	1.
	Without caudal fork;	2.
1.	With bristles;	3.
1.	Without bristles;	4.
2.	Head with tentacles, hinder end slightly lobed;	*Gossea.*
2.	Head without tentacles, hinder end rounded;	*Dasydytis.*
3.	Caudal fork simple;	*Chætonotus.*
3.	Caudal fork dichotomous;	*Chætura.*
4.	Skin smooth;	*Ichthydium.*
4.	Skin with scales or hooks;	*Lepidoderma.*

AMERICAN SPECIES.

Ichthydium podura (O. F. Muller).
Ichthydium sulcatum (Stokes).
Lepidoderma squamatum (Dujardin).
= *Chæt. squammatus,* Stokes.
= *Chæt. tessellatus* Stokes.
= *Chæt. loricatus* Stokes.
Lepidoderma rhomboides (Stokes).
Lepidoderma concinnum (Stokes.)
Chætonotus maximus Ehr.
= *Chæt. gracilis* Stokes.
Chætonotus similis Zelinka.
= *Chæt. maximus* Stokes.
Chætonotus formosus Stokes.
Chætonotus acanthodus Stokes.
Chætonotus brevispinosus Zelinka.
= *Chæt. lanis* Fernald and Stokes.
Chætonotus acanthophorus Stokes.
Chætonotus spinulosus Stokes.
enormis Stokes.
longispinosus Stokes.
spinifer Stokes.
Dasydytes saltitans Stokes.
goniathrix Stokes.
Gossea antennigera (Gosse).

Homologies within the Group of Echinoderms.—Richard Semon (*Morphol. Jahrbuch,* 1889) discusses the homologies which occur within the group of Echinoderms. He thinks that in their broader features the alimentary canal, enterocœle, water-vascular system and nervous system are to be regarded as truly homologous throughout the group,—that is that they have had a common origin and descent (are homophyletic). Other structures which appear very similar, and have often been regarded as homologous, are but analogous, and are to be regarded as homoplastic. Besides these there are others which are intermediate in position, being partly homophyletic and partly homoplastic. Among these are to be enumerated the musculature, a part of the nervous and water-vascular systems of the Holothurians. Semon also refers to the unanimity of results arrived at by him in his previous work on the Synaptidæ (*Jenaische Zeitschrift*, 1888), and those of the brothers Sarasin in their studies of the Echinotheridæ, both concluding that the Holothurians represent the stem form within the group of Echinoderms. Semon does not agree with Newmayr in assigning this position to the Cystidians.

The Ontogeny of Pelvic and Shoulder Girdles.—R. Wiedersheim has studied the development of the girdles in *Scyllium canicula*, *Mustelus lævis*, *Pristiurus melanostomus*, *Torpedo ocellata*, *Thymallus vulgaris*, *Triton helveticus*, *T. alpestris*, *Siredon pisciformis*, *Salamandra maculata*, *Alytes obstetricans*, *Rana temporaria*, *R. esculenta*, *Lacerta agilis*, *Chelone midas*, and *Crocodilus biporcatus*. His general conclusions (*Ant. Anz.* IV.) are as follows:

1. The pelvic and shoulder girdles are strictly homologous; both possess the same Anlage.

2. Both are phylogenetically and ontogenetically later formations than the free limbs.

3. The free limb is to be regarded as the mechanical principle under the formative influence of which a yoking apparatus or fixation point must arise in the body wall. These structures are the shoulder and pelvic girdles.

4. In the Selachii, and apparently in all fishes, the primitive continuity of the girdle and appendage persists into the cartilaginous condition. From the Amphibia on this continuity can only be recognized in the precartilage condition. The cartilaginous Anlage are separate in each region, though there may be in the Amphibia a secondary (transitory or permanent) fusion of the free-extremities with the girdles.

5. From the Amphibia on there is a marked tendency for the separate elements of the girdles to appear separate in the cartilaginous stage. The fusion is secondary, and earlier authors have been in error when describing a single hyaline cartilage blastoma.

6. The pars ischio-pubica and the pars scapularis are phyletically the oldest portions in their respective girdles.

7. In the Fishes and Dipnoi (also in Ichthyosaurus) the pars iliaca does not reach the vertebræ.

8. The pars iliaca first reaches the vertebræ when the vertebrate in question wholly or partially gives up its swimming existence, and its hinder limbs, from being swimming organs, begin to serve as supports. From this moment the weight of the body in the pubic region must be prevented from sinking, and the strong processes of the ventral bones must provide a support for the body weight on the free extremities. A similar support is formed in part by the pectoral fins.

9. A fusion of the partes ischio-pubicæ of both sides to form an unpaired lamina ischio-pubica as in Dipnoi, Ichthyoidea and Derotrema, recurs now and then in the larval stages of the salamanders; *i.e.*, at a time when the tail gives the locomotor impulse.

10. The old question whether the fishes and Amphibia possess only a pars ischiada or also a pars pubica, is to be decided by these later views. The pars pubica is not a structure first appearing in the Reptilia, but is characteristic of the fish and amphibian pelvis. The certainty of this lies first in the relations of the nervus obterratorius, and second in the relationships shown by the embryonic chelonian and crocodile pelvis. In these lie the key for the interpretation of the urodele pelvis, which is repeated ontogenetically in this reptile.

11. Not only is the pelvis not composed of one or more pairs of ventral ribs, but the parts of the pelvis formerly compared by me with such (pars iliaca) are actually the last phylogenetically to appear.

The Segments of the Vertebrate Head.—Van Wighe has recently attacked this problem in the light of the facts afforded by Amphioxus. He finds (*Anat. Anzeiger*, IV., p. 558) that in the adult the gill slits extend back to or even beyond the 27th myotome, while in early specimens the liver empties in the 13th myotome. He also thinks that still earlier specimens would show the liver two segments farther in front. Now if the liver be taken to indicate the line between the head-gut, and that of the body, it follows that the number of segments which in Amphioxus corresponds to the head of the Craniatas is probably nine and cannot be much greater. Amphioxus also affords no difficulty to the view derived from the ontogeny of the sharks that the vagus is a complex of two dorsal nerves. He concludes that the skull never consists of metamerically arranged cartilaginous elements; only in the occipital region behind the vagus is there a possibility of separate cartilaginous neural arches. The parietal musculature and the peripheral nervous system (except the three higher sense nerves) are segmented in the head as in the body region. The number of head myotomes is in general nine, and in those Craniata which have no hypoglossus as a cranial nerve (unless the same and its myotome is aborted), is smaller. To each body and head segment belong a dorsal and a ventral nerve. These are primitively separate, as is shown by Amphioxus and the embryos of the Craniata. In case the ventral nerve is lacking, the corresponding myotome is lacking. The vagus is a complex of two nerves. There is no ground for the view that the Craniata ever possessed more than eight gill pouches (apart from one possibly aborted in the hyoid arch). This number is reached in Heptanchus, Chlamydoselachus, the embryos of the Petromyzons and probably in the Carboniferous genus Xenacanthus.

Horny Teeth in the Marsupialia.—Teche, in studying the skull of a young Myrmecobius (*Anat. Anzeiger*, Aug., '89) finds that a bony ridge runs parallel on either side to the alveolar process of the upper jaw, while in older skulls it exhibits a retrograde development. In sections of the mucous membrane covering this ridge, he found several clusters of tooth-like structures, which upon examination with a higher power were resolved into a large number of rows of teeth, each containing several (as many as 8) horny teeth, nested within each other. In older Myrmecobii no traces of the teeth were found.

On the Genus Clevelandia.—In the NATURALIST for Jan., '90, page 85, occurs the statement that "Clevelandia is reduced to synonomy (by Jenkins and Evermann, Proc. U. S. Nat. Mus., 1888), as was done some time ago in this journal."

The genus Clevelandia was based on a specimen in the collections of the Museum of Comparative Zoölogy, and the diagnosis published in the Proceedings of the Calif. Acad. Sci., second series, Vol. I., Jan., '88.

At the time the diagnosis was written we could not, on account of Museum regulations, examine the skull of the type of Clevelandia. Later, Mr. Evermann sent us specimens of his *Gillichthys guaymasiæ*, requesting us to re-examine the type of Clevelandia. We did so, examining the skull, which was found to be smooth and regularly convex in transverse profile, without ridges or crests. The skull of Gillichthys is depressed, with a strong median crest. These notes were sent to Mr. Evermann. This was in the early part of the summer of '88.

Nevertheless, Jenkins and Evermann, in their rafinesque paper, quoted above, which was issued Jan. 5th, 1889, do not mention this fact, but state that "an examination of the material at hand leads us to believe that the newly proposed genus Clevelandia was based upon characters that are not of generic value, and cannot therefore stand. In Gillichthys the number of dorsal spines has been invariably given as six. The fact that the number of dorsal spines in Clevelandia and in our specimens, which *will agree otherwise with*[1] Gillichthys as limited by Cooper, are four and five respectively, would seem to indicate that the limits of the genus Gillichthys should be extended. This is evidently preferable to basing a new genus upon so slight a character as a difference of one or two dorsal spines." This statement occurs under the head of *G. guaymasiæ*.

These statements of Jenkins and Evermann deserve some comment. The "material at hand" (1) was the types of guaymasiæ, including a prepared skull; (2) a series of skeletons prepared by me in the collections of the Indiana University, where Jenkins and Evermann's hastily prepared paper was written; (3) the notes furnished Mr. Evermann on the types of Clevelandia. Of this material Jenkins and Evermann have seen fit to ignore all but the types of *guaymasiæ* (a description of the skull of this species is conveniently omitted.)

The second sentence quoted above was copied from Jordan and Eigenmann's Review of the Gobiidæ, and may stand. The third sentence needs modification. The type of Clevelandia was described by Steindacher, Ichthyol. Beitr., VIII., 27, as *Gobiosoma longipinne* with four to six dorsal spines, so it is hardly probable that we should have based the new genus of "dorsal spines," as Jenkins and Evermann have supposed.

We have been in hopes for some time of obtaining duplicates of the types of the gobies described by Jenkins and Evermann, in order to determine their generic relations, and figure them for a paper on the gobies of the West coast.

It is perhaps well to state that we have found *Clevelandia longipinne* to be the commonest fish in San Diego Bay. *Gillichthys y cauda* J. & E., is also found in San Diego Bay. To the diagnosis given by Jenkins and Evermann should be added "shoulder with dermal flaps." The statement, "teeth in *a single* series on premaxillaries and mandible," etc., should read "teeth *in broad bands*," etc.

A revision of the diagnosis of the genus Clevelandia is in press.

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[1] The italics are ours.

The genera of West Coast gobies may be distinguished as follows:

a. Eyes normal, functional throughout life, body scaly.
  b. Shoulders without dermal flaps.
    c. Skull depressed.
      d. Skull without distinct median keel, abruptly widened behind eye; scales permanently ctenoid; *Gobius.*
      dd. Skull with a strong median keel, not abruptly widened behind the eye, triangular behind; scales cycloid. (Skull and scales in young as in Gobies); *Gillichthys.*
    cc. Skull strongly convex in transverse profile, perfectly smooth, without ridges or crests; scales minute, cycloid, imbedded; *Clevelandia.*
  bb. Shoulders with one or two small dermal flaps; skull resembling that of the adult Gillichthys;[2] *Lepidogobius.*
aa. Eyes mere vestiges, functional only in the young skull; greatly modified, brain case quadrate; body naked; *Zyphlogobius.*

The intention of reducing to synonymy all species described by other authors is undoubtedly laudable as long as it does not lead an author to shut his eyes to facts, or even wilfully to ignore them.—C. H. EIGENMANN.

Ribs of Salamandra.—Iversen has been studying the skeletons of *Salamandra atra* and *S. maculosa*, and finds (*Anat. Anz.* IV.) on the second vertebræ a strong rib-like outgrowth, which distally expands into a large kidney-shaped plate of hyaline cartilage, which is connected with the shoulder-girdle by fibrous tissue. He recognizes the same element in the "scapula" of the extinct Stegocephali; and if this view be true, the so-called clavicula is the true scapula.

Reptiles and Batrachians from the Caymans and Bahamas.—Mr. S. W. Garman contributes to the Bulletin of the Essex Institute, Vol. XX., an account of these forms, collected for the Museum of Comparative Zoölogy by Mr. C. J. Maynard. Seventeen species are enumerated, of which the following are new: *Sphærodactylus argivus*, from Cayman Brac; *S. corticolus* and *S. decoratus*, from Rum Key; *Anolis luteosignifer*, from Cayman Brac and Little Cayman; *A.*

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[2] *Gillichthys y cauda* probably is a genus distinct from Lepidogobius, but as we have no specimens of the type of Lepidogobius, it perhaps should not be named at present.

maynardii and *A. leucophæus*, from Little Cayman; *Alsophis fuscicauda*, from Cayman Brac; *Ameiva maynardii*, from Inagua; and *Sphærodactylus asper*, from Andros Island. The paper is more valuable from the fact that it contains many notes upon habits, color, etc., made by Mr. Maynard.

The Mammalian Corpus.—Baur shows (*Anat. Anz.* IV.) that in the turtle foot there are two centralia, and claims that if this be true the scaphoid of the mammalian carpus is not a radiale but a centrale, while the "radial sesamoid bone" is a true radiale. He also claims that the "heptadactyly" of Wiedersheim and others has no existence in the mammalian extremity. The prehallux is the radiale, while the pisiform is not the representative of a digit, but a structure which has developed more and more from the Batrachia, where it is unossified.

Zoological News.—Protozoa.—Dr. Joseph Leidy (Proc. Acad. Nat. Sci., Philadelphia, 1889) describes the following species of Gregarinida: *Gregarina philica*, from the proventriculus of *Nyctobates pennsylvanicus; G. actinotus*, from the proventriculus of *Scolopocryplops sexspinosus; G. megacephala*, from *Scutigera forceps;* and *G. microcephala*, from *Hoplocephala bicornis*. The first named species was remarkable in conjugation as the individuals united by the head, the bodies lying side by side.

Mr. G. E. Mainland calls attention (*Jour. Quecket Club*, IV.) to the fact that in Actinosphærium the polariscope reveals "thousands of minute but highly refractive particles vibrating and scintillating throughout the entire sarcode."

Echinoderms.—J. E. Ives presents a study of the color variations of *Ophiura panamensis* and *O. teres*. In the first-named species specimens from the northern localities are the darkest. It does not appear that either species is more variable than our northern brittle stars.

Vermes.—*Brachidnus quadratus* is a new Rotifer described by C. Rousselet (*Journ. Quecket Club*, IV.), from Epping Forest, England.

The second part of the work of M. le Baron St. Joseph upon the Polycheta of the coast of Dinard occupies about 200 pages of the *Annales des Sciences Naturelles*, 1888, and contains descriptions of 23 new species and one new genus. The work is prefaced with an account of the habits of the Aphroditaceæ, which often have ectoparasites, and are themselves at times epizoarians or commensæ of other annelids or of echinoderms.

Mollusca.—H. A. Pilsbry describes the following new molluscs (Proc. Acad. Nat. Science, Philadelphia, 1889): *Holospira elizabethæ*, Guerrero, Mexico; *Pœcilozonites reinianus* var. *goodei*, Bermudas; *Bythinella æquicostata*, Florida; *Amnicola peracuta*, Texas; *Sphærium singleyi*, Texas. He also gives notes on *Microphysa hypalepta*, *Zonites dallianus*, *Z. singleyanus*, *Pœcilozonites bermudensis*, and *Hydrobia monroënsis*. In the same volume W. D. Hartman describes ten new species of shells from the New Hebrides.

Crustacea.—Dr. Leidy describes from a specimen of *Leptocephalus* taken at Beach Haven, N. J., a copepod under the name *Chalimus tenuis*.

Arachnids.—Dr. Leidy records under the generic name Solpuga (Proc. Acad. Nat. Sciences, Philadelphia, 1889) *Galeodes cubæ*, as taken in Florida.

Mr. J. E. Ives has found (Proc. Acad. Nat. Sciences, Philadelphia, 1889) a large number of *Linguatulina diesingii* encysted in the great omentum of a Sooty Mangabey, *Cercocebus fuliginosus*, which died in the Zoological Gardens, at Philadelphia.

Dr. Geo. Marx (Proc. Acad. Nat. Sciences, Philadelphia, 1889) catalogues twelve species of spiders collected by Mr. Heilprin in the Bermudas. The spider fauna is cosmopolitan, only four being restricted to the island. *Lycosa atlantica* is the only new species.

Myriapoda.—C. H. Bollman catalogues (Proc. Phila. Acad., 1889) four species of myriapods collected by Mr. Heilprin in the Bermudas. *Spirobolus heilprini* is regarded as new.

Vertebrata.—Dr. John T. Bowen describes in the *Anatomischer Anzeiger*, Bd. IV., the epitrichial layer in the human epidermis, which was briefly mentioned by Dr. Minot in a former volume of the AMERICAN NATURALIST. Dr. Bowen's conclusions are (1) that the outermost epidermal cells of young embryos form a distinct histological layer; (2) that this layer disappears by the sixth month over most portions of the body; (3) that in certain places, as in the region of the nail, this layer undergoes a keratosis, and forms a part of the stratum corneum; (4) that there are good reasons for regarding this layer as homologous with the epitrichium of animals; (5) that the nail is a modified portion of the stratum lucidum, and becomes exposed by the loss of the epitrichial layer. Whether the cells overlying the stratum lucidum in all parts are homologous with the epitrichium must be decided by further investigations.

Ostroumoff makes the following homologies between the embryos of Lizards and Selachians: In both an embryonic anus, which closes and later opens to form the permanent anus; the allantois anlage with the post-anal gut; the neurenteric canal; the primitive groove, with the split between the caudal lobes; the primitive streak with the caudal lobes.

Prof. Bardeleben has discovered traces of a prepollex and a prehallux in certain Reptilia, and also records the existence of a two-segmented prepollex bearing a nail in Pedetes, and a two-segmented pisiform in Bathyergus.

Fishes.—Mr. S. Garman describes (Bulletin Essex Inst., XX.) a new Muræenoid eel from the Marshall Islands (*Rhinomuræna quæsita*) which is remarkable in the fact that the anterior nostrils are prolonged into tubes, each terminating in a broad flap. The snout is also acute, and the lower jaw possesses three barbels. The length is thirty-three inches, of which two-thirds is occupied by the tail.

Mr. F. C. Test describes and figures (Bulletin Essex Inst., XXI.) certain problematical organs in the skin of the Californian fish Porichthys which are supposed to be phosphorescent in character. Each consists of a lens, reflector, and nerve supply, but none are like any form described by Ussow or Von Lendenfeld. The organs in question are interesting from the fact that they occur in a shore fish, while all other phosphorescent fishes are abyssal in habitat.

Batrachia.—Perenyi thinks, from observations upon Bombinator (*Anat. Anz.* IV., 587), that the notochord is not as has been supposed a derivative of strictly entodermal tissue, but is to be regarded as formed by the lips of the blastopore, tissue which is neither ecto- or entodermal. He regards, farther, the mesoderm as but the duplication of the lower layer cells.

Reptiles.—Junglöw (*Anatom. Anzeiger*, IV.), contrary to Hoffman, states that the heart in *Lacerta agilis* has a double or paired origin, the halves being about the same size, and uniting very soon.

Aves.—M. K. Marage (*Ann. des. Soc. Nat. Zoöl.*) describes the anatomy of the sympathetic nerves in birds, with reference especially to the connections which exist between them and the spinal nerves. He divides his work into four portions, treating respectively of the cephalic, the cervical, the thoracic, and the abdominal nerves, and his work in each of these departments comprises a historic resumé, the structure to be found in the domestic duck, and a comparison of that of the latter with that of other birds. His conclusions are that it is at the level of the thorax that the sympathetic receives most nervous fibres from the spinal cord; that above the thorax there is a single sympathetic trunk, with numerous ganglia terminating in the superior cervical ganglion, while below the thoracic region the sympathetic consists of a single nervous thread, bifurcating only when it encounters an obstacle; some branches put this part in relation with the spinal cord. The arrangement is analogous to that which obtains in reptiles.

Dr. R. W. Shufeldt concludes from a study of the skulls of a large series of forms that the families of Passerine birds should be arranged as follows: Tyrannidæ, Laniidæ, Ampelidæ, Hirundinidæ, Alaudidæ, Certhiidæ, Viveonidæ, Motacillidæ, Sylviidæ, Cœrebidæ, Mniotiltidæ, Cenclidæ, Troglodytidæ, Turdidæ, Paridæ, Tanagridæ, Fringillidæ, Icteridæ, Sturnidæ, Corvidæ, the latter being placed at the top of the scale largely upon the extremely uncertain grounds of psychology.

Dr. Shufeldt has also described the pterytography of the burrowing owl, Ipeotyti, and contributed some other facts regarding the same animal. Both papers are in the *Journal of Morphology* (Vol. III).

Miss Julia B. Platt has been studying the primitive metamerism in the chick. Her first problem was the solution of, Which is the first protovertebra to be formed? and she concludes that the first incision separates the second from the third protovertebra, the second incision completes the third muscle plate, and that later there is found in advance of the first incision one complete protovertebra and a second partial one. She also has studied the primitive segmentation of the brain, where she differs somewhat from other observers. In the chick, according to her observations, there are seven neuromeres found in front of the first protovertebra, and from the *first* of these are developed Pros-thalam and Mesencephalon; the *second* gives rise to the cerebellum, and the other five to the medulla. There are also other points made upon the origin of the nerves, especially the fifth, and Miss Platt is inclined to regard the neuromeres of the medulla as homologous with those of the rest of the cord.

Mammals.—The domestic cat serves as the basis of several studies by Dr. T. B. Stowell. In the *Proceedings of the American Philosophical Society* he continues his studies of the cranial nerves, tracing out the finer branches of the glosso-pharyngeal, accessory, and hypoglossal nerves. Neither paper is capable of abstract, while the adoption of the Wilderian adjectives and adverbs renders them somewhat pedantic and obscure.

Dr. Frederick Tuckerman has recently published several articles upon the taste organs of mammals. In the *Anatomischer Anzieger* occur descriptions of these organs in *Putorius vison,* (Vol. III., p. 941), *Arctomys monax,* (Vol. IV., p. 334), *Perameles nasuta,* (Vol. IV., p. 441). In the latter he finds lateral taste areas overlooked by Poulton. In the *American Journal of Science* for October, 1889, he describes the organs in the common hare. In the *Journal of Anatomy* occur accounts of the taste organs in *Vulpes vulgaris* (Vol. III., p. 201).

Leboucq (*Anat. Anz.,* IV.) finds that on the digits of the fins of fœtal Sirenia and Cetacea there are evident traces of claw-forming epithelium. On the dorsal surface of each digit there is an insinking of the epidermis like that which precedes the formation of nails and claws in other mammalia, but no claw is formed by it.

EMBRYOLOGY.

The Development of Micrometrus aggregatus, one of the Viviparous Surf-perches.—At a recent meeting of the San Diego (Cal.) Medical Society, Dr. C. H. Eigenmann presented the results of his further studies upon the early viviparous development of the very minute ova of *Micrometrus aggregatus.* The differences in the modes of segmentation were pointed out, and a comparison of the embryonic membranes of the different major types of amniotic vertebrates was made. The effect of the loss of a large food-yolk, as illustrated upon comparing the egg of a mammal and a bird, was shown to resemble a similar loss of food-yolk in the eggs of Micrometrus as compared with other large-yolked oviparous fish eggs. [The eggs of *Micrometrus aggregatus* are the smallest fish ova yet described, measuring only a little over 1-140th of an inch, or less than those of most mammalia, thus showing the profound influence of viviparity in causing a diminution in the size of ova.]

The following are Dr. Eigenmann's most recent observations :—

The average pelagic fish egg has a diameter of about 1 mm. ; only